Performance Analysis
of
Price Anderson Amendment Act (PAAA) Non-Compliance Tracking System (NTS) and Occurrence Reporting and Processing System (ORPS) Reportable Incidents
Fiscal Year (FY) 2008 3rd Quarter
(July 1, 2007 – June 30, 2008)

Report No. 18

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INTRODUCTION

Consistent with the requirements outlined in the UC Assurance Plan for LBNL, LBNL identifies operational events, accidents and injuries in order to analyze and trend incidents to determine areas of needed improvement and to ensure the effectiveness of corrective actions to mitigate events and identify recurring events. The Occurrence Reporting Process System (ORPS) performance analysis satisfies the quarterly analysis and trending requirement in DOE Order 231.1A, *Environment, Safety, and Health Reporting*.

This analysis report addresses PAAA NTS- and ORPS-reportable incidents that were identified through the FY08 3rd Quarter reporting period, which is defined as July 1, 2007 through June 30, 2008. Hereafter, any reference to the "FY08 3rd Quarter reporting period" or "current reporting period" means July 1, 2007 through June 30, 2008.

ANALYSIS METHODOLOGY

The methodology for data analysis of Price Anderson Amendment Act (PAAA) Non-Compliance Tracking System (NTS) and ORPS-reportable incidents is based on the requirements outlined in LBNL/PUB-5519 (3), *Data Monitoring and Analysis Program Manual*, which is part of the institutional Issues Management Program. The Issues Management Program satisfies the data analysis requirements to identify recurring events and prevent more serious events from occurring, which are outlined in LBNL/PUB-5520, *UC Assurance Plan for LBNL*, DOE O 226.1A, *Implementation of Department of Energy Oversight Policy*, and DOE O 231.1A, *Environment, Safety and Health Reporting*.

Data analysis reports will be in graphical format, typically runs charts, controls charts and/or Pareto charts in accordance with LBNL/PUB-5519 (3) and will include the analysis of the data for the specified reporting period. This methodology is consistent with the guidance outlined in DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide*, Attachment 6, *ORPS Performance Analysis Analytical Techniques*.

Statistical industry standards will be used to identify trends, adverse or otherwise, when analyzing ORPS and PAAA NTS reportable incidents. Based on an existing or potential trend, additional data will be monitored and analyzed to determine the cause of the trend, identify recurring events, and identify adverse conditions that require corrective actions, as applicable.

A statistical trend is defined as:

- One point outside the control limits;
- Two out of three points two standard deviations above or below the baseline average;
- Four out of five points one standard deviation above or below the baseline average;
- Seven points in a row above or below the baseline average; or
- Seven points in a row that are increasing or decreasing

The control chart is used to determine if the number of ORPS- and PAAA NTS-reportable incidents is within an acceptable statistical threshold and if statistical trends are present.

Pareto charts further break down the data by looking at various combinations of source data to determine the major contributions, the distribution of the contributors, and recurring issues. The cumulative data are reviewed, as appropriate, by:

- Trend Code, identified in Attachment 2, which will reveal common causes in dissimilar events
- Division, the organization that contributed to the event/incident
- Report type, ORPS or PAAA NTS
- Subject matter, the primary focus of the event/incident
- Circumstances surrounding the event/incident

Pareto charts will be included, if warranted. If a potential issue is identified during analysis of the data, the appropriate management and Subject Matter Experts (SMEs) will be contacted. Similarly if statistical analysis and distribution analysis indicate the possibility of a recurrent event, the Office of Contract Assurance (OCA) reviews the subject events with the SMEs.

Where incidents are required to be reported to more than one reporting system, they are counted as only one incident. For example, an incident that is PAAA NTS- and ORPS- reportable is considered only one incident even though it was required to be reported to two systems.

EXECUTIVE SUMMARY

During the FY08 3rd Quarter reporting period, 31 incidents were analyzed, eight PAAA NTS-reportable incidents and 23 ORPS-reportable incidents. All eight of the PAAA NTS-reportable incidents were also ORPS-reportable incidents. Therefore, these eight incidents were counted only once, resulting in the actual number of incidents totaling 23.

A statistical trend was identified in April 2008, when the upper control limit was exceeded. Review of the data determined that the incidents differed in circumstances, subject area, trend code, division, and personnel involved indicating that there are no common causes shared between the incidents.

During the FY08 2nd quarter reporting period (April 1, 2007 to March 31, 2008), a number of external assessments were performed on LBNL Safety Programs, which resulted in numerous findings. As a result, heightened operational and safety awareness has led LBNL management to be more conservative in its approach regarding the evaluation of incidents resulting in the generation of more reports. The trend identified in April 2008 may be attributed to the increased reporting.

The FY07 4th Quarter reporting period (October 30, 2006 – September 30, 2007) indicated a potential issue specific to penetration permit violations. In November 2006, an ORPS report was generated to document several instances of penetration permit violations. Corrective actions were developed and implemented to mitigate and/or remove this issue. Since November 2006, six additional penetration permit violations were identified, three of which were serious enough to warrant generation of ORPS reports (SC-BSO--LBL-ENG-2007-0001, SC-BSO--LBL-OPER-2007-0003, and SC-BSO--LBL-OPER-07-08). An effectiveness review was performed in December 2007 to determine if the corrective actions developed and implemented have prevented recurrence of similar issues. The results of the effectiveness review indicate that the corrective actions developed to address the penetration permit violations from November 2006 through December 2007 adequately prevent recurrence of the issue. In addition, a new issue of adequacy of communication of penetration permit requirements was identified. It is anticipated that the corrective actions put in place to address the communication issue will mitigate and/or address the more recently identified cause of the issue to prevent recurrence.

1.0 ORPS AND PAAA NTS REPORTABLE INCIDENTS

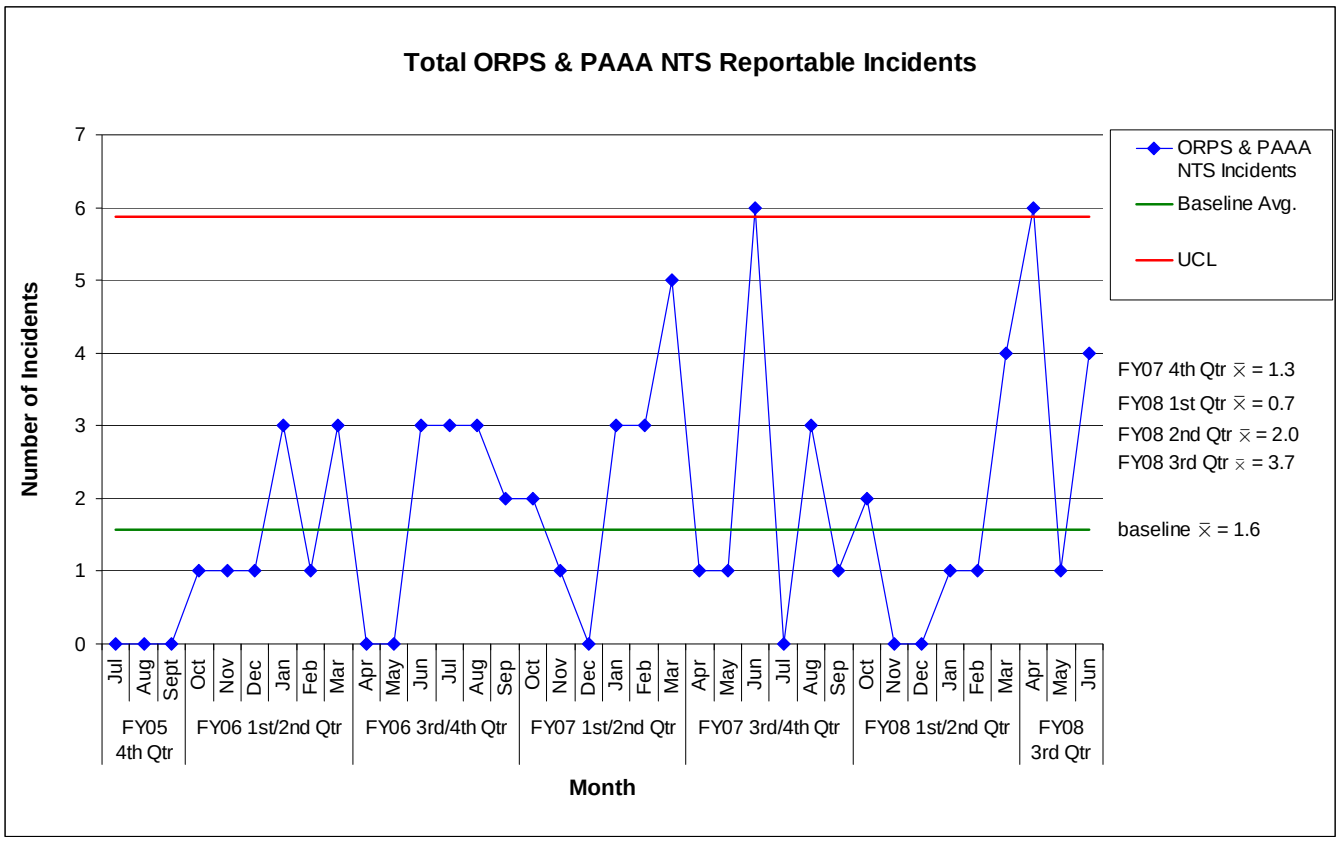

Figure 1.1

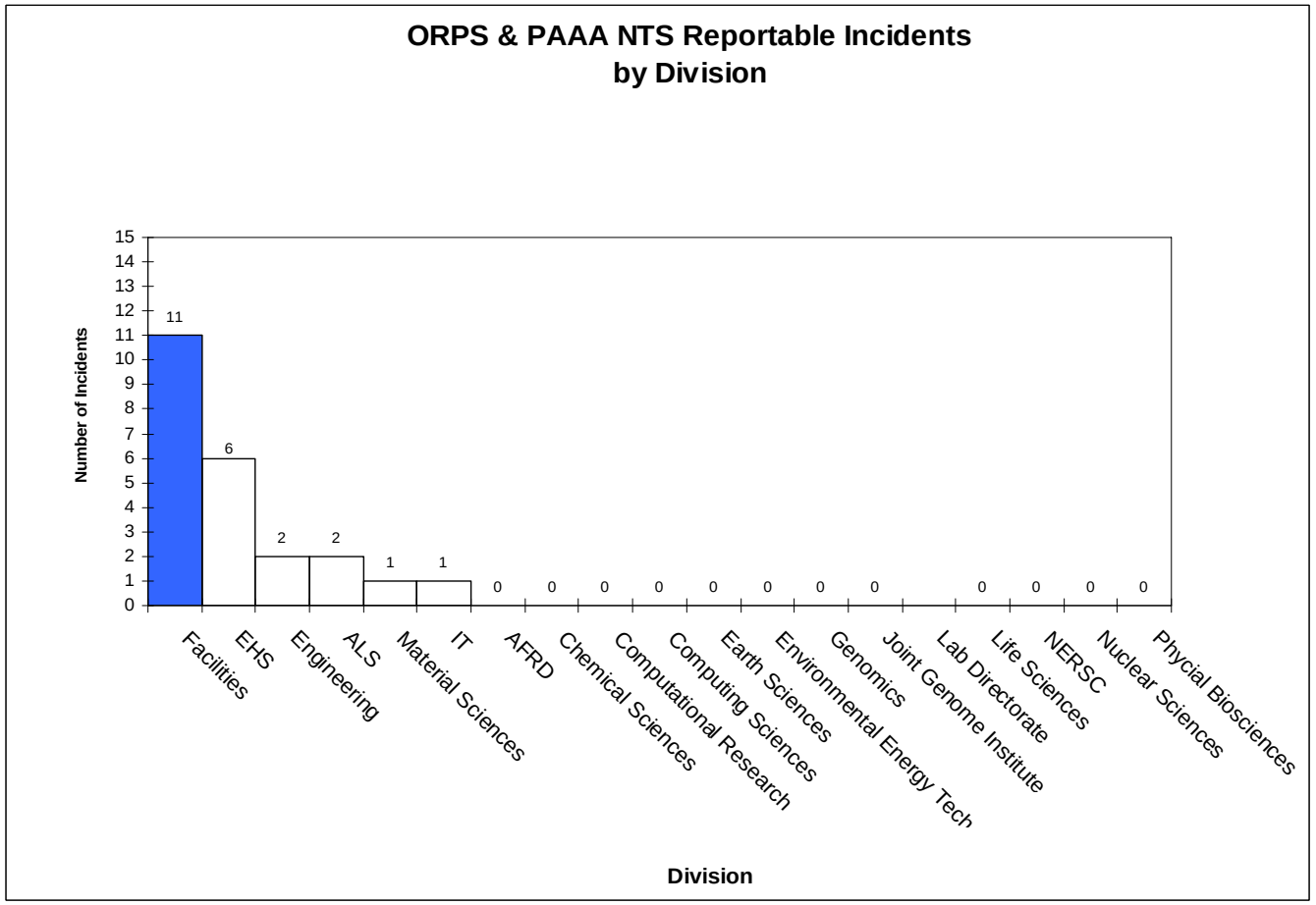

Figure 1.2

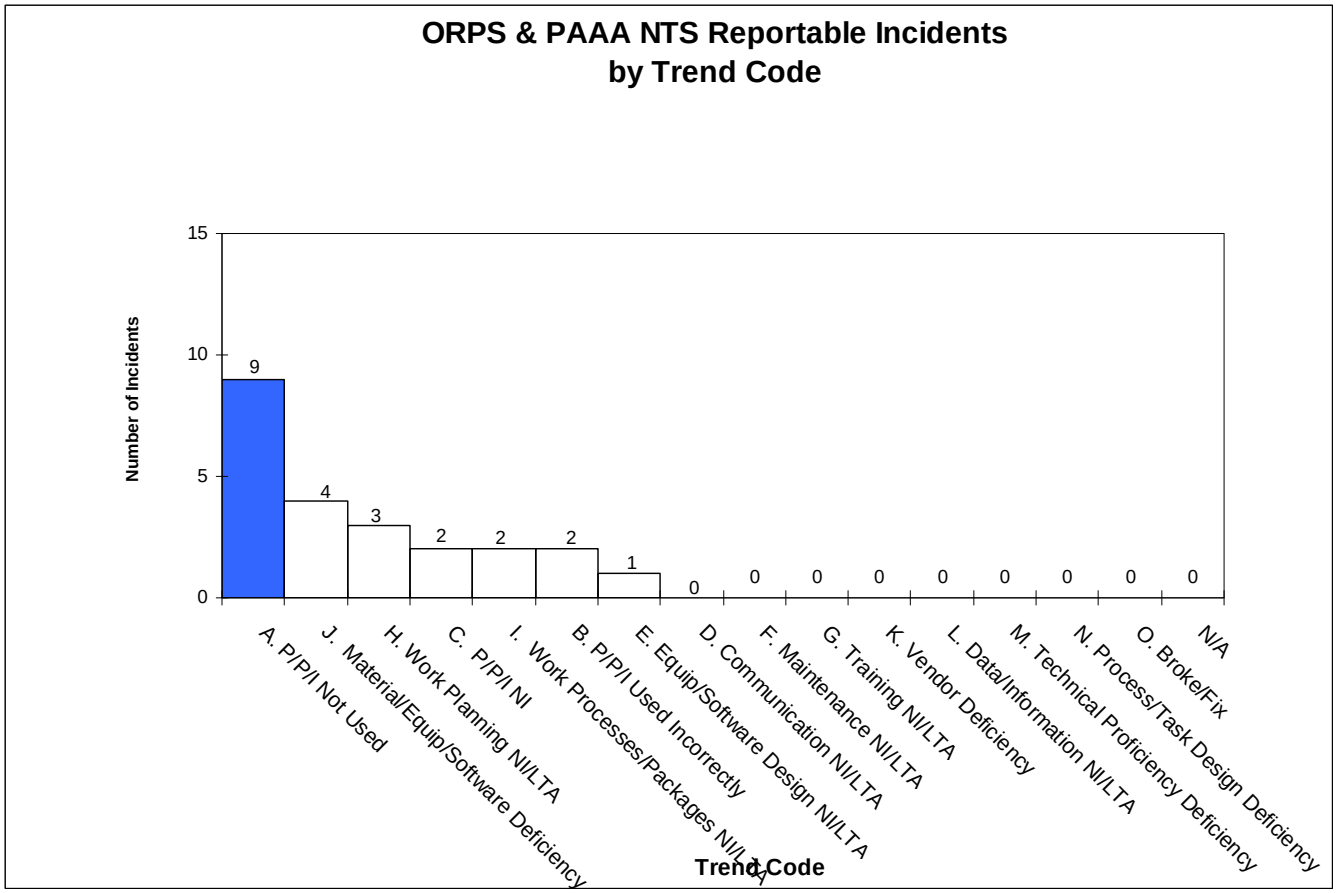
ORPS & PAAA NTS Reportable Incidents
by Trend Code
Number of Incidents
15
10
5
0
9
4
3
2
2
2
1
0
0
0
0
0
0
0
0
0
A. P/P/I Not Used
J. Material/Equip/Software Deficiency
H. Work Planning NI/LTA
C. P/P/I NI
I. Work Processes/Packages NI/LTA
B. P/P/I Used Incorrectly
E. Equip/Software Design NI/LTA
D. Communication NI/LTA
F. Maintenance NI/LTA
G. Training NI/LTA
K. Vendor Deficiency
L. Data/Information NI/LTA
M. Technical Proficiency Deficiency
N. Process/Task Design Deficiency
O. Broke/Fix
N/A
Trend Code

Figure 1.3

Analysis:

During this reporting period, eight ORPS and PAAA NTS-reportable incidents were duplicated. (See Attachment 1 for details on duplicate incidents.) The number of total incidents increased from 20 to 23 from the FY08 2nd Quarter reporting period (April 1, 2007 through March 31, 2008) to the current reporting period.

Figure 1.1 is a Control Chart that identifies the total number of PAAA NTS- and ORPS-reportable incidents. A statistical trend was identified in April 2008, when the upper control limit (UCL) was exceeded. Additionally, there were four incidents identified in both March and June 2008, which came close meeting the 2nd standard deviation limit (4.5). Eleven of the 23 (48%) incidents were identified during the current reporting period, which is almost double the number of incidents identified the 2nd Quarter reporting period (six).

During the past six months, a number of external independent assessments performed of LBNL safety programs. As a result of the assessments performed, a number of issues were identified. As such, LBNL management has heightened awareness across the Laboratory regarding reporting operating experiences. This trend may be attributed to the fact that during the past six months, heightened operational and safety awareness has led LBNL management to be more conservative in its approach regarding the evaluation of incidents resulting in the generation of more reports.

Six incidents were identified in April 2008. Four Facilities Division incidents were identified; one was specific to a water main leak (SC-BSO--LBL-OPER-2008-0004), one was specific to a LOTO deficiency while adding receptacles (SC-BSO--LBL-OPER-2008-0005), one was specific to pending environmental litigation regarding polluted water from LBNL flowing into US waters (SC-BSO--LBL-OPER-2008-0006) and the other was specific to an employee exposed to elevated levels of copper (SC-BSO--LBL-OPER-2008-0007). Two Environmental, Health and Safety (EHS) Division incidents were identified; one was specific to a Department of Toxic Substances Control (DTSC) violation for outer storage containers that inaccurately listed container volume, and the other was specific to the lack of a required safety analysis for Cobalt 60 irradiators that met the thresholds for a hazard category 3 DOE nuclear facility (SC-BSO--LBL-EHS-2008-0001/NTS--BSO-LBL-EHS-2008-0001). The latter was a 10 CFR 830 (QA Rule) PAAA NTS-reportable incident.

One incident was identified in May 2008 to address incorrect delivery of radiological material (SC-BSO--LBL-OPER-2008-0008).

Four incidents were identified in June 2008. Two Facilities incidents were identified; one was specific to a small, quickly-extinguished fire that occurred from hot work performed without a hot work permit (SC-BSO--LBL-OPER-2008-0009) and the other one was specific to a subcontractor receiving a shock from a live 277/480 volt wire (SC-BSO--LBL-OPER-2008-0010). Two EHS incidents were identified; one was specific to medical waste bags that lacked the required secondary containment (SC-BSO--LBL-EHS-2008-0003) and the other was specific to a broken wrist sustained by an employee who tripped over an exposed bolt (SC-BSO--LBL-EHS-2008-0004).

During the FY07 3rd Quarter reporting period (June 1, 2006 – July 30, 2007) analysis of ORPS-reportable incidents determined that the number of incidents exceeded the UCL in June 2007, which indicated an adverse statistical trend. Further analysis was performed that identified evidence of a recurring electrical issue, which resulted in the generation of ORPS Category R (Recurring Occurrences) report SC-BSO--LBL-EHS-2007-0005 in August 2007. The three electrical incidents that were identified during the current reporting period were considered additional examples of LBNL's recurring electrical safety problem. As a result, the current Recurring Electrical ORPS report and root cause analyses was modified to include these three electrical incidents.

Figure 1.2 is a Pareto Chart that breaks down the total data set by Division. Eleven (48%) of the incidents were contributed to by the Facilities Division. Facilities, the largest Operations organization at LBNL, performs a significant amount of work that presents its staff and subcontractors with a variety of hazards. Because of this, it is expected that Facilities will typically contribute a larger number of incidents compared to other Operations or Science organizations. During the current reporting period, Facilities was working on approximately three Capital projects, 93 Small Projects and approximately (6,300) general work requests and maintenance activities.

Two of the four incidents that Facilities contributed to in April 2008 were atypical incidents. One incident was specific to aging infrastructure resulting in a water main leak allowing stormwater to be discharged to the landscape are, and the other was specific to pending environmental litigation that alleges that the Lab has allowed ongoing discharges of polluted storm and non-storm water from LBNL into US waters.

Incidents were reviewed specific to:

- trend code;
- subject area;
- ISM code;
- Facilities suborganizations; and
- circumstances surrounding the incidents

This review indicates there are no common causes that are shared across incidents and there is no evidence of recurring problem within Facilities.

Figure 1.3 is a Pareto Chart that breaks down the total data set by Trend Code. Nine (39%) of the incidents were categorized as Trend Code A, “Policies, Procedures and Instructions Not Used”. Four of the nine incidents (44%) were specific to waste management. With regard to the other five incidents it was determined after review of the trend code, subject, ISM code and circumstances of the incidents that no evidence of a recurring issue exists in this area.

There were a total of four waste management incidents that were identified during the current reporting period. These incidents were hazardous waste-related specific to:

- lack of FTU labeling
- incorrect labeling of a crate containing universal waste resulting in the crate being transported to an off-site location
- inaccurate container volume noncompliances; and
- medical waste bags without secondary containment

Four of these incidents shared a common cause of Trend Code A and three incidents shared a common cause of notices of violation from an external regulatory agency. However, the divisions and circumstances of the incidents differed indicating there is little evidence to suggest that a recurring issue exists in this area.

ATTACHMENT 1 – ORPS AND PAAA NTS REPORTABLE INCIDENTS FOR TH CURRENT REPORTING PERIOD

Item	Title	Report #	FY	Disc. Date	PAAA Duplicates
1.	AA Lithium iron battery exploded	ORPS: OPER-07-07	FY07	3-Aug	
2.	Recurrent Electrical Safety Issues	ORPS: EHS-07-05	FY07	9-Aug	NTS: EHS-07-10
3.	Mercury Spill at Molecular Foundry	ORPS: MSD-07-03	FY07	20-Aug	NTS: EHS-07-08
4.	Underground Pipe Plug Broken by Excavator During Demolition Operation	ORPS: OPER-07-08	FY07	7-Sept	
5.	City Inspection Cites Violation	ORPS: ENG-07-03	FY08	11-Oct	
6.	Recurring Subcontractor Safety Problems	ORPS: EHS-07-06	FY08	19-Oct	NTS:EHS-07-09
7.	Power Outage & Building Excavation	ORPS: OPER-08-01	FY08	1-Jan	
8.	Fire Alarm Conduit Cut in B-81	ORPS: OPER-08-02	FY08	25-Feb	
9.	Superbend Magnet Components Damaged During Repair	ORPS: ALS-08-1	FY08	4-Mar	
10.	Employee Hit Desk and Fractured Knee Cap	ORPS: ALS-08-2	FY08	10-Mar	
11.	Mercury Filled Tubes Transported to Off-Site Warehouse	ORPS: OPER-08-03	FY08	11-Mar	
12.	Maintenance Technician Sustained Electric Shock at ALS	ORPS: ENG-08-01	FY08	12-Mar	NTS: EHS-08-02
13.	Co-60 Irradiators Lack Required Safety Analysis	ORPS: EHS-08-01	FY08	10-Apr	NTS:EHS-08-01
14.	Low Conductivity Water Main Leak	ORPS: OPER-08-04	FY08	15-Apr	
15.	LOTO Deficiency While Adding Receptacles	ORPS: OPER-08-05	FY08	16-Apr	NTS: EHS-07-09*
16.	DTSC Violation for Inaccurate Container Volume	ORPS: EHS-08-02	FY08	21-Apr	
17.	Pending Environmental Litigation	ORPS: OPER-08-06	FY08	25-Apr	
18.	Employee Exposed to Elevated Levels of Copper at HILAC Project Site	ORPS: OPER-08-07	FY08	30-Apr	NTS: EHS-08-03
19.	Incorrect Delivery of Radiological Material	ORPS: OPER-08-08	FY08	9-May	
20.	Medical Waste Bags Without Secondary Containment Notice	ORPS: EHS-08-03	FY08	9-Jun	
21.	Employee Tripped Over Exposed Bolt and Broke Wrist	ORPS: EHS-08-04	FY08	17-Jun	
22.	Minor Fire from Hot Work at Bldg 31	ORPS: OPER-08-09	FY08	17-Jun	
23.	Subcontractor Received Shock from Live 277/480 Volt Wire Without Injury	ORPS: OPER-08-10	FY08	19-Jun	NTS: EHS-07-09*

*=denotes items rolled up into an already existing NTS report

ATTACHMENT 2 – TREND CODES

Trend Code
A. Policies/Procedures/Instructions Not Used
B. Policies/Procedures/Instructions Used Incorrectly
C. Policies/Procedures/Instructions Need Improvement
D. Communication Needs Improvement /Less Than Adequate
E. Equipment/Software Design Needs Improvement /Less Than Adequate
F. Maintenance Needs Improvement /Less Than Adequate
G. Training Needs Improvement /Less Than Adequate
H. Work Planning Needs Improvement /Less Than Adequate
I. Work Processes/Packages Need Improvement /Less Than Adequate
J. Material/Equipment/Software Deficiency
K. Vendor Deficiency
L. Data/Information Needs Improvement /Less Than Adequate
M. Technical Proficiency Deficiency
N. Process/Task Design Deficiency
O. Broke/Fix